

REMARKS

Claims 1-15 are pending in this application. By this Amendment, claim 3 is canceled and claims 1, 4, 5, 7, 9, 10, 13, 14 and 15 are amended. No new matter is added.

Section 112 Rejection

The Office Action rejects claims 4, 5, 10, 14 and 15 under 35 U.S.C 112, second paragraph, as being indefinite for containing asserted informalities. Applicant has amended these claims to correct the Markush language as suggested by the Examiner. Reconsideration and withdrawal of the rejection of claims 4, 5, 10, 14 and 15 under 35 U.S.C. § 112, second paragraph, are respectfully requested.

Section 103 Rejections

The Office Action rejects claims 1, 2, 4, 5 and 6 under 35 U.S.C. 103(a) as being unpatentable over Hung et al. (U.S. Patent No. 6,380,096) in view of Yanagida (U.S. Patent No. 5,338,399). The Office Action separately rejects claims 7, 8 and 10 and of claims 11, 12, 14 and 15 under 35 U.S.C. 103(a) as being unpatentable over Hung et al. in view of Yanagida and of claims 3, 9 and 13 under 35 U.S.C. 103(a) as being unpatentable over Hung et al. in view of Yanagida and further in view of Sakai et al. (U.S. Patent No. 5,503,901). These rejections are traversed as they may apply to the amended claims.

Claims 1-6

Claim 1 has been amended so as to include all features of claim 3, which has now been canceled.

It is a feature of the invention as defined in amended claim 1 that the dry-etching step is performed under a condition of $0 < P_2/(P_1+P_2) \leq 0.5$ where P_1 is a partial pressure of the C_4F_8 gas and P_2 is a partial pressure of the C_5F_8 gas. The Office Action notes that Hung and Yanagida do not disclose the specific value of the partial pressure of C_4F_8 and C_5F_8 gasses. However, the Office Action asserts that Sakai discloses that the gas supply means for controlling the gas flow rate or the partial pressure of the C_4F_8 gas.

Sakai states, at column 7, lines 6-11, that it has been found from his experiments that when a C_4F_8 gas and at least one of Kr and Xe gases are introduced under a reduced pressure into an air-tight reaction chamber for accommodating a semiconductor substrate and the gas is changed to a plasma, an excellent selectivity can be obtained. Namely, the partial pressure of the C_4F_8 gas seems to mean $C_4F_8/(C_4F_8+Kr)$ or $C_4F_8/(C_4F_8+Xe)$. Furthermore, Sakai states, at column 7, lines 2-5, that when the ion introduced onto the substrate are controlled so that a ratio of a CF_3^+ ion concentration to the total $(CF_2)_n^+$ ion concentration is 8% or less, an excellent selectivity can be obtained. Namely, Sakai focuses attention on $CF_3^+/(CF_3^+ + (CF_2)_n^+)$ and $C_4F_8/(C_4F_8+Kr)$ or $C_4F_8/(C_4F_8+Xe)$, but does not focus attention on $C_4F_8/(C_4F_8+C_5F_8)$. The CF_3^+ ion and $(CF_2)_n^+$ ion are generated by ionizing the C_4F_8 gas. Accordingly, $CF_3^+/(CF_3^+ + (CF_2)_n^+)$ is clearly distinguished from $C_4F_8/(C_4F_8+C_5F_8)$.

None of the cited references disclose $C_4F_8/(C_4F_8+C_5F_8)$.

Claims 9 and 13

The above argument for claim 1 is also relevant to claims 9 and 13, which have been rewritten in independent form.

Claims 7, 8 and 10

Claim 7 has been amended to include the limitation that the etching stopper film is made of SiN or SiC.

The etching stopper film corresponds to Hung's lower stop layer (12) made of SiN. Hung's TABLE 2 shows etching gas including CHF₃ and C₄F₈ at third substep. However, Hung does not disclose C_xF_y gas ($x \geq 5$ and $y \leq (2x-1)$). In Yanagida's invention, the layer (1) under the insulating layer (3) to be etched is made of silicon. Yanagida states, at column 2, lines 22-24, that if the higher fluorocarbon gas is used alone, resist selectivity or silicon underlying layer selectivity cannot be increased. Yanagida does not disclose SiN selectivity. Therefore, it would not have been obvious that Yanagida's etching gas is used in Hung's structure in which SiN is used as an etching stop layer.

Claims 11, 12, 14 and 15

The first film of claim 11 corresponds to the etching stopper film of claim 7. The first film is made of SiN or SiC. Therefore, the above argument for claim 7 is also relevant to claims 11, 12, 14 and 15.

For at least the above reasons, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are respectfully requested.

Conclusion

Applicant respectfully submits that this application is in condition for allowance and such action is earnestly solicited. If the Examiner believes that anything further is desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicant's undersigned representative at the telephone number listed below to schedule a personal or telephone interview to discuss any remaining issues.

Should this paper not be considered timely filed, Applicant petitions for an appropriate extension of time. Please charge any such extension of time or any other fee deficiency or credit any overpayment to Deposit Account No. 01-2300, **making reference to Attorney Docket No. 107317-00040.**

Respectfully submitted,



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Enclosure: Petition for Extension of Time